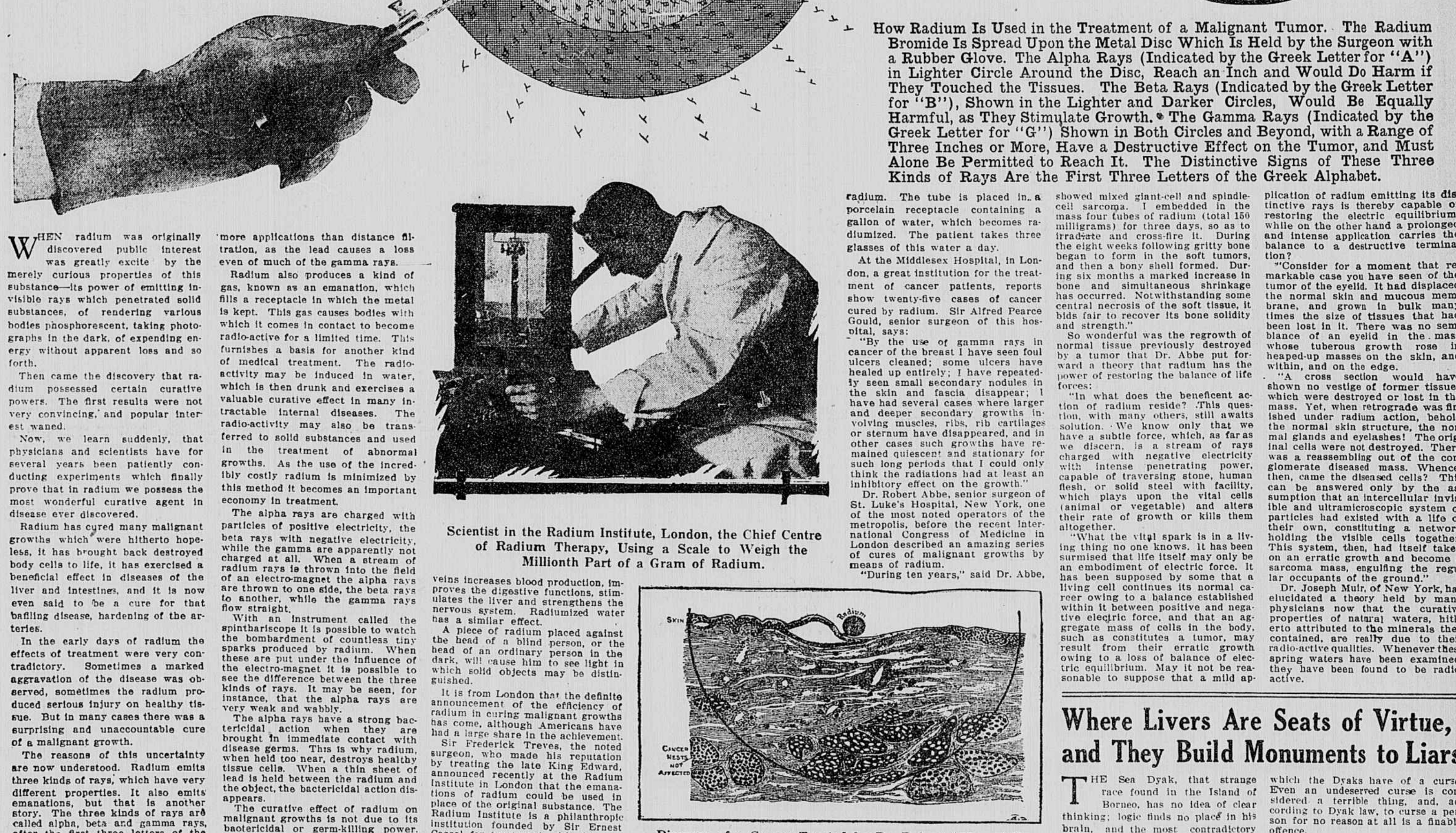
NEW MIRACLES OF MEDICINE ACCOMPLISHED BY RADIUM

Leading Physicians and Surgeons of the World Report a Surprising Number of Cases of Cancerous Growths Cured, Stomach and Liver Trouble Relieved, and Even Arterial Hardening Checked



How Radium Is Used in the Treatment of a Malignant Tumor. The Radium Bromide Is Spread Upon the Metal Disc Which Is Held by the Surgeon with a Rubber Glove. The Alpha Rays (Indicated by the Greek Letter for "A") in Lighter Circle Around the Disc, Reach an Inch and Would Do Harm if They Touched the Tissues. The Beta Rays (Indicated by the Greek Letter for "B"), Shown in the Lighter and Darker Circles, Would Be Equally Harmful, as They Stimulate Growth. The Gamma Rays (Indicated by the Greek Letter for "G") Shown in Both Circles and Beyond, with a Range of Three Inches or More, Have a Destructive Effect on the Tumor, and Must Alone Be Permitted to Reach It. The Distinctive Signs of These Three Kinds of Rays Are the First Three Letters of the Greek Alphabet.

WHEN radium was originally discovered public interest was greatly excite by the merely curious properties of this substance—its power of emitting invisible rays which penetrated solid substances, of rendering various bodies phosphorescent, taking photographs in the dark, of expending energy without apparent loss and so forth.

Then came the discovery that radium possessed certain curative powers. The first results were not very convincing, and popular interest waned.

Now, we learn suddenly, that physicians and scientists have for several years been patiently conducting experiments which finally prove that in radium we possess the most wonderful curative agent in disease ever discovered.

Radium has cured many malignant growths which were hitherto hopeless, it has brought back destroyed body cells to life, it has exercised a beneficial effect in diseases of the liver and intestines, and it is now even said to be a cure for that baffling disease, hardening of the arteries.

In the early days of radium the effects of treatment were very contradictory. Sometimes a marked aggravation of the disease was observed, sometimes the radium produced serious injury on healthy tissue. But in many cases there was a surprising and unaccountable cure of a malignant growth.

The reasons of this uncertainty are now understood. Radium emits three kinds of rays, which have very different properties. It also emits emanations, but that is another story. The three kinds of rays are called alpha, beta and gamma rays, after the first three letters of the Greek alphabet.

The most distinguished scientists in the world, including Madame Curie, the discoverer of radium, Sir William Crookes, Sir William Ramsay, Professors Soddy and Rutherford as well as many physicians and surgeons have been absorbed in the task of studying these three kinds of rays and establishing the differences between them.

The alpha rays are the shortest, having a length of about an inch. They have a destructive effect on healthy tissue. That was why, in early experiments, radium often caused such injury. The beta rays came next in length. They are about an inch and a half long. They have a stimulating effect on cell growth. They are, therefore, very dangerous when applied to cancers and abnormal growths, but they are useful in other ways.

The gamma rays are the longer, having a length of three inches or over. These are the rays that have effected marvellous cures of cancerous growths. They check the development of abnormal cells and gradually re-establish a normal cell balance.

The alpha rays are stopped by glass, aluminum and other metals. The beta rays are stopped by lead, but the gamma rays penetrate lead. A thin sheet of lead will, therefore, protect the tissues against the injurious alpha and beta rays. These rays are also eliminated by holding the radium at about two inches. Filtration through lead requires many more applications than distance filtration, as the lead causes a loss even of much of the gamma rays.

Radium also produces a kind of gas, known as an emanation, which fills a receptacle in which the metal is kept. This gas causes bodies with which it comes in contact to become radio-active for a limited time. This furnishes a basis for another kind of medical treatment. The radio-activity may be induced in water, which is then drunk and exercises a valuable curative effect in many intractable internal diseases. The radio-activity may also be transferred to solid substances and used in the treatment of abnormal growths. As the use of the incredibly costly radium is minimized by this method it becomes an important economy in treatment.

The alpha rays are charged with particles of positive electricity, the beta rays with negative electricity, while the gamma are apparently not charged at all. When a stream of radium rays is thrown into the field of an electro-magnet the alpha rays are thrown to one side, the beta rays to another, while the gamma rays flow straight.

With an instrument called the spintbariscope it is possible to watch the bombardment of countless tiny sparks produced by radium. When these are put under the influence of the electro-magnet it is possible to see the difference between the three kinds of rays. It may be seen, for instance, that the alpha rays are very weak and wabbly.

The alpha rays have a strong bactericidal action when they are brought in immediate contact with disease germs. This is why radium, when held too near, destroys healthy tissue cells. When a thin sheet of lead is held between the radium and the object, the bactericidal action disappears.

The curative effect of radium on malignant growths is not due to its baotericidal or germ-killing power. This is the opinion of Dr. Robert Abbe and other high authorities. In treating malignant growths the bactericidal action of the alpha rays must be eliminated to secure good results. Their curative value is attributed to some imperfectly understood power of restoring the balance of normal cell growth.

The gamma rays have a decided effect in checking life. When meal worms were radiumized they went on living as meal worms indefinitely, "veritable Methuselahs," while their sisters and brothers, unradiumized, progressed for generations, completing cycles of beetles, eggs and meal worms over and over again.

There are many ways of applying radium. One method, shown in the large illustration at the head of this page, consists in preparing a paste with radium bromide and spreading it upon a metal plate having a long handle. The operator, wearing a rubber glave, applies this to the tumor. The alpha and beta rays may be eliminated by keeping this at a distance of about two inches or by interposing a sheet of lead.

The length of application varies with the case. Dr. Abbe speaks of a case where he applied radium for thirty minutes to a malignant growth and it began to retrograde in ten days. In another case he applied it for twenty-four hours.

Two other methods of application consist in placing the radium in a leaden tube, open at one end, and in spreading it on a cloth which is attached to the surface to be treated.

Sulfate of radium injected into the veins increases blood production, improves the digestive functions, stimulates the liver and strengthens the nervous system. Radiumized water has a similar effect.

A piece of radium placed against the head of a blind person, or the head of an ordinary person in the dark, will cause him to see light in which solid objects may be distinguished.

It is from London that the definite announcement of the efficiency of radium in curing malignant growths has come, although Americans have had a large share in the achievement.

Sir Frederick Treves, the noted surgeon, who made his reputation by treating the late King Edward, announced recently at the Radium Institute in London that the emanations of radium could be used in place of the original substance. The Radium Institute is a philanthropic institution founded by Sir Ernest Cassel for treatment with this material. It possesses more radium than any other institution.

"Radium gives off this emanation constantly," said Sir F. Treves. "The amount of the emanation depends on the amount of radium used. The emanation practically never weakens. The radio-activity of the piece of radium from which it exudes is inextinguishable."

As a matter of fact, it has been estimated that an atom of radium sheds one-half its radio-activity in 2,500 years. The emanation probably lasts for something approximating that time, although its duration has not yet been calculated.

Radium emanations contained in sealed metal applicators are now sent out to doctors throughout England for patients who cannot obtain radium or go to the institute. A gram of radium costs $100,000, but the emanation is given almost for nothing.

At the Radium Institute many cures of inoperable cancers or malignant tumors were announced. One woman had an enormous sarcoma of the collarbone. She had been informed by surgeons that the only remedy was removal of the entire right arm and shoulder. A tube containing 116 milligrams of radium was imbedded in the tumor for twelve hours on two consecutive days. Within a month all signs of the growth had disappeared. Now, after the lapse of six months, there is no recurrence.

A school teacher, aged thirty-five, had an inoperable carcinoma of the thyroid giand of the neck. After three series of treatments with radium the enlargement and hardening of the thyroid disappeared. The patient has now returned to work.

Most striking results have been obtained from drinking radiumized water. Out of 100 per cent of advanced rheumatism cases 40 per cent showed marked improvement, 30 per cent derived benefit, and the remaining 30 per cent remained unchanged.

Walter A. Brady, the seventy-year-old clerk of Part V, Supreme Court of New York, reports that he has been cured of a hopeless case of hardening of the arteries by radiumized water. He was told that there was no prospect of a cure.

Three months ago he began taking a preparation of radiumized water put up by a Berlin physician.

"The results have been amazing," says Mr. Brady. "From an arterial pressure of 230 pounds, which is a terrible one, my pressure has been reduced to 150 pounds, not far above normal, and I feel twenty years younger. My regular physician has been keeping my chart, and he is as enthusiastic as I am."

The apparatus used consists of a tiny tube containing a particle of radium. The tube is placed in a porcelain receptacle containing a gallon of water, which becomes radiumized. The patient takes three glasses of this water a day.

At the Middlesex Hospital, in London, a great institution for the treatment of cancer patients, reports show twenty-five cases of cancer cured by radium. Sir Alfred Pearce Gould, senior surgeon of this hospital, says:

"By the use of gamma rays in cancer of the breast I have seen foul ulcers cleaned; some ulcers have healed up entirely; I have repeatedly seen small secondary nodules in the skin and fascia disappear; I have had several cases where larger and deeper secondary growths involving muscles, ribs, rib cartilages or sternum have disappeared, and in other cases such growths have remained quiescent and stationary for such long periods that I could only think the radiations had at least an inhibitory effect on the growth."

Dr. Robert Abbe, senior surgeon of St. Luke's Hospital, New York, one of the most noted operators of the metropolis, before the recent International Congress of Medicine in London described an amazing series of cures of malignant growths by means of radium.

"During ten years," said Dr. Abbe, "I have been able to study the efficiency of these specimens of Madame Curie's radium on more than 750 individual cases in private, including 250 epitheliomas of all parts; 180 carcinomas of the tongue, throat, oesophagus, breast, intestines and other visceral organs; 50 sarcomas of the skin, parotid gland, bones, etc., besides goitres, tumors of the liver and mediastinum and a variety of naevi, moles, papilloma, etc."

In all cases where he had not obtained beneficial results Dr. Abbe said it was due to error in using the radium. There were three types of results (1) destruction of tissues too closely in contact (2) stimulation and harmful results, and (3) efficient retrograde degeneration of malignant growths, with lasting benefits amounting at times to a surgical cure.

Since he had understood that the gamma rays were the cause of the degeneration of tumors Dr. Abbe said he had never failed to obtain beneficial results.

Here is an example of one of Dr. Abbe's many cases:

"A young man had the upper three inches of the right humerus entirely replaced by a myeloid tumor expanding in lemon shape. Under cocaine anaesthesia a portion removed showed mixed giant-cell and spindle-cell sarcoma. I embedded in the mass four tubes of radium (total 150 milligrams) for three days, so as to irradiate and cross-fire it. During the eight weeks following gritty bone began to form in the soft tumors, and then a bony shell formed. During six months a marked increase in bone and simultaneous shrinkage has occurred. Notwithstanding some central necrosis of the soft tissue, it bids fair to recover its bone solidity and strength."

So wonderful was the regrowth of normal tissue previously destroyed by a tumor that Dr. Abbe put forward a theory that radium has the power of restoring the balance of life forces:

"In what does the beneficent action of radium reside? This question, with many others, still awaits solution. We know only that we have a subtle force, which, as far as we discern, is a stream of rays charged with negative electricity with intense penetrating power, capable of traversing stone, human flesh, or solid steel with facility, which plays upon the vital cells (animal or vegetable) and alters their rate of growth or kills them altogether.

"What the vital spark is in a living thing no one knows. It has been surmised that life itself may only be an embodiment of electric force. It has been supposed by some that a living cell continues its normal career owing to a balance established within it between positive and negative electric force, and that an aggregate mass of cells in the body, such as constitutes a tumor, may result from their erratic growth owing to a loss of balance of electric equilibrium. May it not be reasonable to suppose that a mild application of radium emitting its distinctive rays is thereby capable of restoring the electric equilibrium, while on the other hand a prolonged and intense application carries the balance to a destructive termination?

"Consider for a moment that remarkable case you have seen of the tumor of the eyelid. It had displaced the normal skin and mucous membrane, and grown in bulk many times the size of tissues that had been lost in it. There was no semblance of an eyelid in the mass whose tuberous growth rose in heaped-up masses on the skin, and within, and on the edge.

"A cross section would have shown no vestige of former tissues which were destroyed or lost in the mass. Yet, when retrograde was finished under radium action, behold the normal skin structure, the normal glands and eyelashes! The original cells were not destroyed. There was a reassembling out of the conglomerate diseased mass. Whence, then, came the diseased cells? This can be answered only by the assumption that an intercellular invisible and ultramicroscopic system of particles had existed with a life of their own, constituting a network holding the visible cells together. This system, then, had itself taken on an erratic growth and become a sarcoma mass, engulfing the regular occupants of the ground."

Dr. Joseph Muir, of New York, has elucidated a theory held by many physicians now that the curative properties of natural waters, hitherto attributed to the minerals they contained, are really due to their radio-active qualities. Whenever these spring waters have been examined, they have been found to be radio-active.

Scientist in the Radium Institute, London, the Chief Centre of Radium Therapy, Using a Scale to Weigh the Millionth Part of a Gram of Radium.

Diagram of a Cancer Treated by Dr. Robert Abbe, of New York, with Radium. The White Dots on Black Ground Show the Cancer Cells Degenerated Under the Influence of Radium.

From the Medical Record, New York.

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Where Livers Are Seats of Virtue, and They Build Monuments to Liars

THE Sea Dyak, that strange race found in the Island of Borneo, has no idea of clear thinking; logic finds no place in his brain, and the most contradictory opinions seem to dwell together in perfect harmony in the turbid stream of his mind. The liver, strange to relate, is regarded by the Dyak as the seat of various praiseworthy qualities and emotions. Bravery is considered the highest of virtues, and when they wish to describe the great courage of a man they say he has a "brave liver." Intelligence also resides in the liver, and a man of knowledge is one possessing an "enlightened liver." Kindness is the quality of the man who has a "large liver," and perseverance that of one who has a "hard liver." A weak, undecided man is spoken of as one who has a "soft liver."

The Dyak is truthful and honest, and these qualities are rather unusual in Eastern races. Families are often away from their homes for weeks at a time, living in litte huts on their farms, and though no one is left in charge of their rooms in the long village house in the jungle, things are seldom lost.

After an experience of nearly twenty years in Borneo, a writer states that he knew of only two instances of theft. One was the theft of rice. The woman who lost the rice most solemnly and publicly cursed the thief, whoever it might be. The next night the rice was left at her door. The other was a theft of money. In this case, too, the thief was cursed. The greater part of the money was afterward returned to the box from which it had been abstracted. Both these incidents show the great dread which the Dyaks have of a curse. Even an undeserved curse is considered a terrible thing, and, according to Dyak law, to curse a person for no reason at all is a finable offence.

As regards their truthfulness, it is said of the Dyaks that so disgraceful do they consider the deceiving of others by an untruth, that such conduct is handed down to posterity by a curious custom. They heap up a pile of branches of trees in memory of the man who has uttered a great lie, so that future generations may know of his wickedness and take warning from it. The persons deceived start the tugong bula—"the liar's monument"—by heaping up a large number of branches in some conspicuous spot by the side of the path leading from one village to another. Every passer-by contributes to it, and at the same time curses the man in memory of whom it is.

The Dyaks consider the adding to any tugong bula they may pass a sacred duty, the omission of which will meet with supernatural punishment, and so, however pressed for time a Dyak may be, he stops to throw on the pile some branch or twig. Believing, as the Dyaks do, in the efficacy of curses, it is easy to understand how a Dyak would dread the accumulation of curses that would necessarily accompany the formation of a tugong bula.

From an Eastern point of view, the morals of the Dyaks are good. Divorce is very uncommon after the birth of a child, but where there are no children, for such reasons as incompatibility of temper or idleness, divorce is obtainable by either husband or wife on payment of a small fine.